

Exhibit 1

As Played in Court 05/10/23

Designation List Report



MacKay, Kenneth

2022-05-10

Sonos Affirmatives	00:32:12
Google Counters	00:06:16
TOTAL RUN TIME	00:38:28



Documents linked to video:

T36

T38

T41



T48

T84


MacKay_K_vol1 - As Played in Court 05/10/23

DESIGNATION	SOURCE	DURATION	ID
11:08 - 11:12	MacKay, Kenneth 2022-05-10	00:00:19	MacKay_K_vol1.1
	11:08 Q. Mr. MacKay, good to see you again.		
	11:09 For the record, could you just state your		
	11:10 full name and spell it for us.		
	11:11 A. My full name is Kenneth John MacKay.		
	11:12 K-E-N-N-E-T-H, J-O-H-N, M-A-C capital K-A-Y.		
15:07 - 15:10	MacKay, Kenneth 2022-05-10	00:00:11	MacKay_K_vol1.2
	15:07 Q. (By Mr. Shea) Now, this lists your		
	15:08 current title, I believe, at Google, as senior		
	15:09 staff software engineer; is that correct?		
	15:10 A. It does.		
24:17 - 24:19	MacKay, Kenneth 2022-05-10	00:00:07	MacKay_K_vol1.3
 T84.1	24:17 What I'd like to do now is introduce the		
	24:18 30(b)(6) notice and -- and start to ask you some		
	24:19 things about that.		
25:06 - 25:08	MacKay, Kenneth 2022-05-10	00:00:12	MacKay_K_vol1.10
	25:06 Have you seen this document before,		4
	25:07 Mr. MacKay?		
	25:08 A. I don't think so.		
25:22 - 26:01	MacKay, Kenneth 2022-05-10	00:00:14	MacKay_K_vol1.4
 T84.11.1	25:22 Q. My understanding is Google has designated		
	25:23 you as their representative with respect to		
	25:24 subpart (i) of this topic No. 1. Is that		
	25:25 consistent with your understanding as well?		
	26:01 A. Yes.		
29:01 - 29:06	MacKay, Kenneth 2022-05-10	00:00:14	MacKay_K_vol1.5
	29:01 Q. Can you think of anyone currently		
	29:02 employed at Google that you would consider to be		
	29:03 more knowledgeable about the subject matter of --		
	29:04 of this topic of our deposition notice, other than		
	29:05 yourself?		
	29:06 A. No.		
29:14 - 29:17	MacKay, Kenneth 2022-05-10	00:00:11	MacKay_K_vol1.6
 Clear	29:14 Do you understand that -- that by		
	29:15 providing testimony in a 30(b)(6) capacity, that		
	29:16 you are testifying on behalf of -- of Google?		
	29:17 A. Yes.		
50:05 - 50:06	MacKay, Kenneth 2022-05-10	00:00:06	MacKay_K_vol1.7

MacKay_K_vol1 - As Played in Court 05/10/23

DESIGNATION	SOURCE	DURATION	ID
	50:05 Do you have your own Google players that		MacKay_K_vol1.7
	50:06 you use?		
50:08 - 50:08	MacKay, Kenneth 2022-05-10	00:00:01	MacKay_K_vol1.8
	50:08 THE DEPONENT: Yes.		
50:09 - 50:11	MacKay, Kenneth 2022-05-10	00:00:10	MacKay_K_vol1.10
	50:09 Q. (By Mr. Shea) And when you are playing		5
	50:10 music on your own Google players, what app or apps		
	50:11 do you use to play music on those players?		
50:13 - 50:18	MacKay, Kenneth 2022-05-10	00:00:18	MacKay_K_vol1.10
	50:13 THE DEPONENT: We use voice commands,		6
	50:14 typically.		
	50:15 Q. (By Mr. Shea) Are -- are there -- was		
	50:16 there ever a time or -- or is there a time now		
	50:17 where you use any mobile app to play music to your		
	50:18 Google players?		
50:20 - 50:20	MacKay, Kenneth 2022-05-10	00:00:02	MacKay_K_vol1.10
	50:20 THE DEPONENT: Not me specifically.		7
50:21 - 50:23	MacKay, Kenneth 2022-05-10	00:00:06	MacKay_K_vol1.9
	50:21 Q. (By Mr. Shea) Have you ever in the past		
	50:22 used any mobile app to play music on -- on a		
	50:23 Google player?		
50:25 - 50:25	MacKay, Kenneth 2022-05-10	00:00:01	MacKay_K_vol1.10
	50:25 THE DEPONENT: Yes.		
55:15 - 55:17	MacKay, Kenneth 2022-05-10	00:00:05	MacKay_K_vol1.11
	55:15 Q. Okay. So a Wi-Fi network would be one		
	55:16 example of a data network?		
	55:17 A. Yes.		
55:21 - 55:24	MacKay, Kenneth 2022-05-10	00:00:14	MacKay_K_vol1.12
 T84.3.1	55:21 Q. (By Mr. Shea) -- each of the players		
	55:22 listed in paragraph 3 of Exhibit 2, is it true that		
	55:23 those -- those players are capable of connecting to		
	55:24 and communicating over a Wi-Fi network?		
56:01 - 56:01	MacKay, Kenneth 2022-05-10	00:00:02	MacKay_K_vol1.13
	56:01 THE DEPONENT: Yes.		
57:04 - 57:08	MacKay, Kenneth 2022-05-10	00:00:30	MacKay_K_vol1.14
 Clear	57:04 Q. What is a "speaker group" as Google uses		
	57:05 that term?		

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DESIGNATION	SOURCE	DURATION	ID
	57:06 A. I would describe it as a set of devices		
	57:07 that appears as a castable -- as a Cast target.		
	57:08 And when casted to, they all play together --		
57:10 - 57:10	MacKay, Kenneth 2022-05-10	00:00:02	MacKay_K_vol1.15
	57:10 A. -- specifically -- specifically audio.		
57:16 - 57:22	MacKay, Kenneth 2022-05-10	00:00:28	MacKay_K_vol1.16
	57:16 What do you mean by "appears as a Cast		
	57:17 target"?		
	57:18 A. So what I mean is that you can cast to		
	57:19 the group. So in -- if you're in a sender app, for		
	57:20 example, and you hit the Cast button, then the		
	57:21 group would show up as -- as a potential Cast		
	57:22 option.		
60:17 - 60:17	MacKay, Kenneth 2022-05-10	00:00:02	MacKay_K_vol1.17
 T36.1	60:17 I'm going to mark that as Exhibit 36.		
61:07 - 61:13	MacKay, Kenneth 2022-05-10	00:00:20	MacKay_K_vol1.18
 T36.1.1	61:07 So if you see in the first statement		
	61:08 there it says "Group any combination of Google Nest		
	61:09 or Google Home speakers and displays and Chromecast		
	61:10 devices together for synchronous music throughout		
	61:11 the home."		
	61:12 Do you see that?		
	61:13 A. Yes.		
63:01 - 63:11	MacKay, Kenneth 2022-05-10	00:00:46	MacKay_K_vol1.19
 Clear	63:01 Q. Now, are you familiar with a term,		
	63:02 "static group"?		
	63:03 A. Yes.		
	63:04 Q. What is a "static group"?		
	63:05 A. So that is a group that the user defines		
	63:06 using the Google Home app, I think, is the only		
	63:07 way. So they define a group, and then that group		
	63:08 becomes a castable target.		
	63:09 Q. And how does a "static group" compare to		
	63:10 what is referred to as a "speaker group" in		
	63:11 Exhibit 36?		
63:13 - 63:16	MacKay, Kenneth 2022-05-10	00:00:17	MacKay_K_vol1.20
	63:13 THE DEPONENT: Let me go back.		
	63:14 So a "static group" is what is being		
	63:15 referred to in -- in this document, "Create and		



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DESIGNATION	SOURCE	DURATION	ID
	63:16 manage speaker groups," I think.		
63:19 - 63:19	MacKay, Kenneth 2022-05-10	00:00:03	MacKay_K_vol1.21
	63:19 THE DEPONENT: Yeah, that's accurate.		
64:11 - 65:02	MacKay, Kenneth 2022-05-10	00:01:17	MacKay_K_vol1.22
	64:11 Q. So then can you tell me what a static --		
	64:12 excuse me -- what a "dynamic group" is?		
	64:13 A. So a "dynamic group" refers to the		
	64:14 ability to add or remove devices from an ongoing		
	64:15 playback. So -- and it's a temporary association,		
	64:16 I guess you would say, of the devices that only		
	64:17 exist as long as -- as long as that Cast session is		
	64:18 ongoing.		
	64:19 Q. So are you able to articulate for me		
	64:20 the -- the distinction between what you call a		
	64:21 "dynamic group" and what you call a "static group"?		
	64:22 A. I guess the main distinction would be how		
	64:23 it's set up. So the static group is set up through		
	64:24 the Google Home app explicitly by the user and		
	64:25 named. Whereas, a dynamic group is sort of set up,		
	65:01 I would say, behind the scenes in response to a		
	65:02 user adding or removing devices.		
65:09 - 65:11	MacKay, Kenneth 2022-05-10	00:00:05	MacKay_K_vol1.23
	65:09 does "static" have any meaning		
	65:10 in terms of characterizing what kind of group it		
	65:11 is?		
65:14 - 65:20	MacKay, Kenneth 2022-05-10	00:00:26	MacKay_K_vol1.24
	65:14 THE DEPONENT: So I guess maybe what		
	65:15 you're getting at is that the static group is		
	65:16 persistent, like it doesn't -- it doesn't go away		
	65:17 once playback is completed.		
	65:18 Q. (By Mr. Shea) Is that generally why		
	65:19 Google uses the phrase "static" to refer to those		
	65:20 kinds of groups?		
65:22 - 65:25	MacKay, Kenneth 2022-05-10	00:00:09	MacKay_K_vol1.25
	65:22 THE DEPONENT: I think we just chose		
	65:23 static as sort of the opposite of -- of dynamic, or		
	65:24 like as an alternative to dynamic to differentiate		
	65:25 the two kinds of groups.		
70:15 - 70:19	MacKay, Kenneth 2022-05-10	00:00:19	MacKay_K_vol1.26

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DESIGNATION	SOURCE	DURATION	ID
	70:15 as a result		MacKay_K_vol1.26
	70:16 of a user selecting a particular speaker group for		
	70:17 launch on a controller device, will that then		
	70:18 trigger the controller device to send a launch		
	70:19 message for that selected speaker group?		
70:21 - 70:25	MacKay, Kenneth 2022-05-10	00:00:20	MacKay_K_vol1.27
	70:21 THE DEPONENT: So when the user selects a		
	70:22 speaker group to cast to, I believe that would		
	70:23 typically cause a launch message to be sent from		
	70:24 the controller device to a member of the speaker		
	70:25 group.		
72:11 - 73:06	MacKay, Kenneth 2022-05-10	00:01:25	MacKay_K_vol1.28
	72:11 Q. And at a high level, can you -- can you		
	72:12 describe for me what the leader-specific		
	72:13 functionality is that's carried out by a leader		
	72:14 once a group is launched?		
	72:15 A. So the sender has set up a connection to		
	72:16 the -- the leader's endpoint representing the		
	72:17 group. And that device is -- received a launch		
	72:18 message, and so that device would launch the		
	72:19 appropriate receiver app, which could be either a		
	72:20 JavaScript app or C++ code.		
	72:21 And then if that app plays audio, the		
	72:22 leader would distribute that audio to any connected		
	72:23 followers.		
	72:24 Q. In addition to distributing that audio to		
	72:25 connected followers, does a leader also distribute		
	73:01 time stamps associated with that audio?		
	73:02 A. Yes.		
	73:03 Q. And does the leader also play a		
	73:04 particular role in a time synchronization process		
	73:05 with the followers?		
	73:06 A. Yes.		
86:03 - 86:04	MacKay, Kenneth 2022-05-10	00:00:05	MacKay_K_vol1.29
	86:03 I'm going to introduce another document		
 T38.1	86:04 here. This is going to be Exhibit 38.		
86:13 - 86:15	MacKay, Kenneth 2022-05-10	00:00:06	MacKay_K_vol1.30
	86:13 Q. (By Mr. Shea) Does this document		
	86:14 look familiar to you?		

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DESIGNATION	SOURCE	DURATION	ID
	86:15 A. Yes.		
87:06 - 87:08	MacKay, Kenneth 2022-05-10	00:00:05	MacKay_K_vol1.31
	87:06 Who -- who was the original author of --		
	87:07 of the document you see here?		
	87:08 A. I was.		
87:14 - 87:15	MacKay, Kenneth 2022-05-10	00:00:09	MacKay_K_vol1.10
	87:14 Q. (By Mr. Shea) And the -- do you recall		8
	87:15 when you would have prepared this document?		
87:17 - 87:19	MacKay, Kenneth 2022-05-10	00:00:07	MacKay_K_vol1.10
	87:17 THE DEPONENT: I'm not sure of the exact		9
	87:18 date. I think I probably started writing it in		
	87:19 2015 sometime.		
88:07 - 88:14	MacKay, Kenneth 2022-05-10	00:00:22	MacKay_K_vol1.32
 T38.2.1	88:07 Q. Okay. In the "Overview" section, there's		
	88:08 a statement says -- that says "The primary goal of		
	88:09 multiroom audio is to play out the audio in sync		
	88:10 across all the devices in a group."		
	88:11 Do you see that?		
	88:12 A. Yes.		
	88:13 Q. Is that an accurate characterization of		
	88:14 what the primary goal of multiroom audio is?		
88:16 - 88:19	MacKay, Kenneth 2022-05-10	00:00:12	MacKay_K_vol1.33
	88:16 THE DEPONENT: Yeah. So this is the same		
	88:17 thing that we were discussing earlier where the		
	88:18 goal is to play the audio out of the speakers of		
	88:19 the devices, the physical speaker at the same time.		
94:01 - 94:04	MacKay, Kenneth 2022-05-10	00:00:12	MacKay_K_vol1.34
 Clear	94:01 When a Google player is included as part		
	94:02 of a previously created group, does it store a		
	94:03 group name and a UUID for that group?		
	94:04 A. Yes.		
94:05 - 94:25	MacKay, Kenneth 2022-05-10	00:01:19	MacKay_K_vol1.11
	94:05 Q. When a Google player is included in a		0
	94:06 previously created group, does it store an		
	94:07 indication of whether it is currently the leader?		
	94:08 A. Not persistently.		
	94:09 Q. When you say "not persistently," can you		
	94:10 tell me what you mean.		

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DESIGNATION	SOURCE	DURATION	ID
	<p>94:11 A. So when a device is elected as a leader</p> <p>94:12 or considers itself to be the leader, there is</p> <p>94:13 information stored in RAM on the device, which I</p> <p>94:14 guess you'd call "volatile memory." So if the</p> <p>94:15 device is turned off, then that information would</p> <p>94:16 be lost. But it's not stored persistently on disk,</p> <p>94:17 so it doesn't persist across reboot.</p> <p>94:18 Q. Okay. So does that then mean that when a</p> <p>94:19 device is rebooted, it then reruns an election</p> <p>94:20 process for the leader?</p> <p>94:21 A. The election process runs continually</p> <p>94:22 amongst all the devices that are online.</p> <p>94:23 Q. Okay. And so when a -- when a device</p> <p>94:24 is -- is rebooted, it -- it -- it then -- it joins</p> <p>94:25 that process not really having any knowledge of --</p>		
95:14 - 95:20	<p>MacKay, Kenneth 2022-05-10</p> <p>95:14 focusing</p> <p>95:15 specifically on -- on whichever player is currently</p> <p>95:16 elected as the leader of a particular group, will</p> <p>95:17 that player store in memory identifiers of each</p> <p>95:18 device that is currently a follower of that group?</p> <p>95:19 A. It stores information about the followers</p> <p>95:20 that are currently connected to it.</p>	00:00:23	MacKay_K_vol1.35
97:21 - 98:03	<p>MacKay, Kenneth 2022-05-10</p> <p>97:21 Q. -- does the</p> <p>97:22 follower store, for instance, an IP address of the</p> <p>97:23 leader?</p> <p>97:24 A. Yes. Well, in -- in general, it -- it</p> <p>97:25 stores -- yeah, it stores the IP address of the</p> <p>98:01 leader. And then if the leader changes, then it</p> <p>98:02 would -- it would change -- it would reconnect to</p> <p>98:03 the different leader and store that IP address.</p>	00:00:25	MacKay_K_vol1.36
98:04 - 98:13	<p>MacKay, Kenneth 2022-05-10</p> <p>98:04 Q. Does the follower store any identifying</p> <p>98:05 information for other followers that are in that</p> <p>98:06 group?</p> <p>98:07 A. So when the device is on -- online, all</p> <p>98:08 of the devices that think that they're members of</p> <p>98:09 the group advertise their information over mDNS,</p> <p>98:10 and then each device stores in volatile memory.</p>	00:00:39	MacKay_K_vol1.11 1

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DESIGNATION	SOURCE	DURATION	ID
	98:11 Essentially the -- the information that's contained		
	98:12 in that mDNS record which -- and including the IP		
	98:13 address.		
98:14 - 98:18	MacKay, Kenneth 2022-05-10	00:00:17	MacKay_K_vol1.37
	98:14 Q. -- so in that case, each		
	98:15 follower would -- would store the IP address for		
	98:16 another follower and -- and it would also have the		
	98:17 UUID of the group, such that it would know that the		
	98:18 follower was a member of that particular group?		
98:20 - 98:24	MacKay, Kenneth 2022-05-10	00:00:14	MacKay_K_vol1.38
	98:20 THE DEPONENT: So it -- it knows -- it		
	98:21 stores the information that each device has		
	98:22 announced over mDNS. So it -- it knows that the		
	98:23 other device considers itself to be part of the		
	98:24 group, I would say.		
110:24 - 111:09	MacKay, Kenneth 2022-05-10	00:00:35	MacKay_K_vol1.39
	110:24 Limiting the question to Google's own		
	110:25 player -- Cast-enabled players that we've been		
	111:01 talking about today, is it true that each of those		
	111:02 players can be a member of several static groups?		
	111:03 A. If the device supports groups at all		
	111:04 then, yes, it can be a member of multiple static		
	111:05 groups.		
	111:06 Q. Is there any maximum limit on how many		
	111:07 static groups a given Google player can be a part		
	111:08 of?		
	111:09 A. We don't have an explicit limit.		
111:25 - 112:01	MacKay, Kenneth 2022-05-10	00:00:12	MacKay_K_vol1.40
	111:25 MR. SHEA: So maybe -- I'm going to ask		
	112:01 you about one more document, for the time being,		
112:07 - 112:09	MacKay, Kenneth 2022-05-10	00:00:17	MacKay_K_vol1.41
 T41.1	112:07 loaded up, it's going to be Exhibit 41. The full		
	112:08 Bates number is GOOG-SONOSWT- -- WTDX-48792 through		
	112:09 -838.		
112:13 - 112:17	MacKay, Kenneth 2022-05-10	00:00:10	MacKay_K_vol1.42
 T41.1.1	112:13 Q. (By Mr. Shea) Okay. And so the -- the		
	112:14 title of this document is "GC4A Technical		
	112:15 Specification."		
	112:16 Do you see that?		

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DESIGNATION	SOURCE	DURATION	ID
	112:17 A. Yes.		
113:04 - 113:07	MacKay, Kenneth 2022-05-10	00:00:16	MacKay_K_vol1.43
 T41.11	113:04 Q. Okay. So I just have one specific 113:05 question on this document, which is going to be PDF 113:06 page 11. Bates number page ends -802. 113:07 A. Okay.		
113:22 - 114:05	MacKay, Kenneth 2022-05-10	00:00:29	MacKay_K_vol1.44
 T41.11.2	113:22 Q. And then the second bullet there says 113:23 "Even if a device is part of a" group -- or 113:24 "groups," plural, "it will still be available for 113:25 casting as a standalone device." 114:01 Do you see that? 114:02 A. Yes. 114:03 Q. Is that an accurate description of how 114:04 Google's players that exist today operate in a 114:05 scenario where they are part of one or more groups?		
114:07 - 114:09	MacKay, Kenneth 2022-05-10	00:00:08	MacKay_K_vol1.45
	114:07 THE DEPONENT: So if -- whether or not a 114:08 device is a member of a group or multiple groups, 114:09 you can still cast to it as a single device.		
116:04 - 116:09	MacKay, Kenneth 2022-05-10	00:00:18	MacKay_K_vol1.11 2
	116:04 So my questions right now are meant to be 116:05 limited to a -- a newly created speaker group, as 116:06 opposed to a speaker group that's being edited or 116:07 modified after being initially created, if that 116:08 helps clarify. 116:09 A. Okay.		
116:10 - 116:13	MacKay, Kenneth 2022-05-10	00:00:12	MacKay_K_vol1.46
	116:10 Q. is it true that a 116:11 newly created speaker group is not automatically 116:12 launched at the time that it is created? 116:13 A. If it's a static group, yes.		
116:14 - 116:18	MacKay, Kenneth 2022-05-10	00:00:19	MacKay_K_vol1.11 3
	116:14 Q. Do you know -- why is it that the -- that 116:15 functionality exists, where you allow a user to 116:16 create a static group but then don't automatically 116:17 launch it? 116:18 A. Well, we don't --		

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DESIGNATION	SOURCE	DURATION	ID
116:20 - 117:03	MacKay, Kenneth 2022-05-10 116:20 THE DEPONENT: We wouldn't know what to 116:21 automatically launch. It's up to the user. 116:22 Q. (By Mr. Shea) Is -- so between the time 116:23 that the group is first created and the time when 116:24 it's launched, in that in between time, is there a 116:25 phrase that you use to describe what the state of 117:01 that group is in? 117:02 A. I don't think so. Not that I can think 117:03 of.	00:00:45	MacKay_K_vol1.11 4
117:04 - 117:08  Clear	MacKay, Kenneth 2022-05-10 117:04 Q. Would it be fair to say that at that time 117:05 where a group has been created but not yet 117:06 launched, that the group exists in an unlaunched 117:07 state? 117:08 A. Yes.	00:00:15	MacKay_K_vol1.47
117:10 - 117:13	MacKay, Kenneth 2022-05-10 117:10 Q. (By Mr. Shea) And -- and is another way 117:11 to think about that, that at the -- in the time 117:12 between when the group is created and when it is 117:13 launched, that the speaker group would be inactive?	00:00:11	MacKay_K_vol1.11 5
117:15 - 117:15	MacKay, Kenneth 2022-05-10 117:15 THE DEPONENT: Yes, I think so.	00:00:01	MacKay_K_vol1.11 6
117:17 - 117:24	MacKay, Kenneth 2022-05-10 117:17 but just to clarify, you 117:18 agree that a speaker group is something that is 117:19 saved by a user in advance of being launched? 117:20 A. Well, again, the -- the group might never 117:21 be launched. Like you might never cast to the 117:22 group. So it's -- I would characterize it as -- a 117:23 static group is something that the user configures 117:24 and it's saved persistently.	00:00:30	MacKay_K_vol1.48
117:25 - 118:02	MacKay, Kenneth 2022-05-10 117:25 Q. -- and saved prior to any 118:01 possible time of launch, if any; is that right? 118:02 A. Yes.	00:00:09	MacKay_K_vol1.49
120:20 - 120:22	MacKay, Kenneth 2022-05-10 120:20 How would you characterize what the UUID	00:00:07	MacKay_K_vol1.50

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DESIGNATION	SOURCE	DURATION	ID
	120:21 of the group is?		
	120:22 A. It's the identifier for the group.		
120:23 - 121:01	MacKay, Kenneth 2022-05-10	00:00:11	MacKay_K_vol1.51
	120:23 Q. -- which device generates		
	120:24 the UUID for the group?		
	120:25 A. The device that's running the Google Home		
	121:01 app.		
122:15 - 122:22	MacKay, Kenneth 2022-05-10	00:00:38	MacKay_K_vol1.52
	122:15 is it also the case that the		
	122:16 Google Home app would store, at least temporarily,		
	122:17 the -- some sort of identifiers for the particular		
	122:18 Google players that have been added to the group?		
	122:19 A. Well, it must store at least the -- its		
	122:20 local connection to those devices. And the names		
	122:21 are displayed to the users, so those must also be		
	122:22 stored -- sorry -- the names of the --		
122:24 - 122:24	MacKay, Kenneth 2022-05-10	00:00:02	MacKay_K_vol1.53
	122:24 A. -- the names of the individual devices.		
127:14 - 127:19	MacKay, Kenneth 2022-05-10	00:00:24	MacKay_K_vol1.54
	127:14 Q. If a user wants the ability to listen to		
	127:15 music on two particular Google players at a		
	127:16 specific time of day, such as the morning, does the		
	127:17 Google software allow the user to create a speaker		
	127:18 group, including those two speakers, and name it		
	127:19 Morning?		
127:21 - 127:22	MacKay, Kenneth 2022-05-10	00:00:03	MacKay_K_vol1.55
	127:21 THE DEPONENT: So the user can name the		
	127:22 group whatever they like.		
166:06 - 166:09	MacKay, Kenneth 2022-05-10	00:00:17	MacKay_K_vol1.56
	166:06 Q. (By Mr. Shea) once a		
	166:07 user has input a name into this field and hit save,		
	166:08 do you have an understanding of what happens next		
	166:09 on the device running the Google Home app?		
166:11 - 167:02	MacKay, Kenneth 2022-05-10	00:01:10	MacKay_K_vol1.57
	166:11 THE DEPONENT: So I don't know all of the		
	166:12 actions that the Google Home app takes. But I can		
	166:13 tell you specifically what actions it would take in		
	166:14 regards to the devices that the user selected.		

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DESIGNATION	SOURCE	DURATION	ID
	166:15 Q. (By Mr. Shea) Okay.		
	166:16 A. So the -- the -- the Google Home app		
	166:17 would form connections to the devices that the user		
	166:18 selected, assuming that they're, I guess, online		
	166:19 and connectable. And then it would send a group --		
	166:20 a join group message to each of those devices		
	166:21 instructing them to add themselves to the group.		
	166:22 And the devices would handle that, as we		
	166:23 discussed before, I guess, in terms of storing		
	166:24 the group information locally and beginning the		
	166:25 leader election process. Once the -- once the		
	167:01 message is handled by a given device, then the		
	167:02 response is sent back to the Google Home app.		
171:08 - 171:10	MacKay, Kenneth 2022-05-10	00:00:06	MacKay_K_vol1.58
	171:08 I'm going to call		
	171:09 this Exhibit 43 just so we have a placeholder for		
	171:10 it on the record.		
171:15 - 171:21	MacKay, Kenneth 2022-05-10	00:00:21	MacKay_K_vol1.59
	171:15 Q. (By Mr. Shea) Mr. MacKay, are you		
	171:16 familiar with this source code module?		
	171:17 A. Yes.		
	171:18 Q. And can you -- is -- is this source code		
	171:19 module related to the process on the player side		
	171:20 for receiving a join group message?		
	171:21 A. Yes.		
178:03 - 178:14	MacKay, Kenneth 2022-05-10	00:00:30	MacKay_K_vol1.60
	178:03 said on -- at line 448 that that was a place where		
	178:04 the -- the group configuration would be stored.		
	178:05 Do I have that right?		
	178:06 A. So there's -- there's the storage locally		
	178:07 in RAM, like in volatile memory, on line 448,		
	178:08 which --		
	178:09 Q. Okay.		
	178:10 A. -- so that -- that adds it locally in --		
	178:11 in RAM. And then on line 506 is where we store the		
	178:12 configuration -- or it's not actual storage.		
	178:13 That's the -- where we make the call to store the		
	178:14 group configuration persistently.		
181:05 - 181:10	MacKay, Kenneth 2022-05-10	00:00:18	MacKay_K_vol1.61

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DESIGNATION	SOURCE	DURATION	ID
	181:05 For recordkeeping purposes, I'm going to		MacKay_K_vol1.61
	181:06 call the multizone setup.cc file that we talked		
	181:07 about, which is 27 through 31, I'm going to refer		
	181:08 to that as Exhibit 44.		
	181:09 (Exhibit 44 was marked for identification		
	181:10 by the court reporter and is attached hereto.)		
194:25 - 195:06	MacKay, Kenneth 2022-05-10	00:00:25	MacKay_K_vol1.62
	194:25 And, again, in a scenario where you're		
	195:01 not adding a device to -- to an existing group that		
	195:02 has a Cast session, but, again, are creating a new		
	195:03 group, then the -- the -- the Cast state of that		
	195:04 player being included in the new group will not		
	195:05 change.		
	195:06 A. If the new group is a static group, yes.		
195:10 - 195:15	MacKay, Kenneth 2022-05-10	00:00:28	MacKay_K_vol1.63
	195:10 And so what I'd like to ask now is, after		
	195:11 a first group is created that includes a particular		
	195:12 Google player, for instance, the kitchen player in		
	195:13 our example here, can a user then create a second		
	195:14 speaker group that also includes that same player?		
	195:15 A. Yes.		
199:15 - 199:19	MacKay, Kenneth 2022-05-10	00:00:26	MacKay_K_vol1.64
	199:15 Q. Okay. So just to close out on the --		
	199:16 the -- the process for creating a speaker group, as		
	199:17 far as you're aware, have there been any changes to		
	199:18 the player side functionality for joining a speaker		
	199:19 group between November 2019 and the present date?		
199:20 - 199:24	MacKay, Kenneth 2022-05-10	00:00:12	MacKay_K_vol1.65
	199:20 A. I don't think so. Not any substantial		
	199:21 changes.		
	199:22 Q. At least no changes that would be		
	199:23 relevant to the functionality we've been discussing		
	199:24 so far today?		
200:01 - 200:04	MacKay, Kenneth 2022-05-10	00:00:09	MacKay_K_vol1.66
	200:01 THE DEPONENT: I don't think so. I think		
	200:02 we might have added a field to the join group		
	200:03 message. But I don't think that would affect what		
	200:04 we've been discussing.		
219:17 - 219:18	MacKay, Kenneth 2022-05-10	00:00:14	MacKay_K_vol1.72

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DESIGNATION	SOURCE	DURATION	ID
	219:17 As far as you know, does -- is the same		MacKay_K_vol1.72
	219:18 Cast protocol used by iOS apps and Android apps?		
219:20 - 220:02	MacKay, Kenneth 2022-05-10	00:00:22	MacKay_K_vol1.73
	219:20 THE DEPONENT: Well, the app-specific		
	219:21 parameters may differ between the different app		
	219:22 versions. But as far as I know, the use of the		
	219:23 other fields is not different.		
	219:24 Q. (By Mr. Shea) Okay. And the overall		
	219:25 structure of the message itself would be the same		
	220:01 for both platforms?		
	220:02 A. Yes.		
237:17 - 237:20	MacKay, Kenneth 2022-05-10	00:00:15	MacKay_K_vol1.74
	237:17 have there been any changes from November 2019 to		
	237:18 the present day to the player side functionality		
	237:19 for receiving and handling a launch message for a		
	237:20 speaker group?		
237:22 - 237:24	MacKay, Kenneth 2022-05-10	00:00:06	MacKay_K_vol1.75
	237:22 THE DEPONENT: Specifically for a speaker		
	237:23 group or just in general handling a launch message		
	237:24 that may or may not be to a speaker group?		
238:09 - 238:12	MacKay, Kenneth 2022-05-10	00:00:14	MacKay_K_vol1.76
	238:09 Q. (By Mr. Shea) Can you -- are you able to		
	238:10 think of any specific changes that would be		
	238:11 relevant to the function that we've been discussing		
	238:12 with respect to launching speaker groups?		
238:14 - 238:20	MacKay, Kenneth 2022-05-10	00:00:20	MacKay_K_vol1.77
	238:14 THE DEPONENT: I think at the level that		
	238:15 we've been discussing, I can't think of anything		
	238:16 that would have impacted the overall flow		
	238:17 significantly. So there would have been specific		
	238:18 details that changed, but I don't think, at the		
	238:19 general level that we discussed, anything would		
	238:20 have changed.		
238:22 - 239:02	MacKay, Kenneth 2022-05-10	00:00:23	MacKay_K_vol1.78
	238:22 Mr. MacKay, are you familiar with		
	238:23 a message called set playback devices?		
	238:24 A. Yes.		
	238:25 Q. Is set playback devices another type of		
	239:01 message that might be used to initiate the launch		

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DESIGNATION	SOURCE	DURATION	ID
	239:02 of a static speaker group?		
239:04 - 239:08	MacKay, Kenneth 2022-05-10	00:00:17	MacKay_K_vol1.79
	239:04 THE DEPONENT: I would say that set		
	239:05 playback devices doesn't explicitly launch a		
	239:06 speaker group.		
	239:07 Q. (By Mr. Shea) Okay. So can you unpack		
	239:08 that for me a bit?		
239:10 - 240:08	MacKay, Kenneth 2022-05-10	00:01:31	MacKay_K_vol1.80
	239:10 THE DEPONENT: So are you asking me maybe		
	239:11 to provide an example where set playback devices		
	239:12 could cause the launch of a speaker group?		
	239:13 Q. (By Mr. Shea) Yeah. That -- that would		
	239:14 be a helpful starting point.		
	239:15 A. Okay. So one of the purposes of set		
	239:16 playback devices is to initiate what we call a		
	239:17 transfer of a media session. And the target of		
	239:18 that transfer can be a speaker group.		
	239:19 And so if the application in question and		
	239:20 the -- if the receiver application in question		
	239:21 supports real transfer, then as part of the		
	239:22 execution of that transfer, the source device		
	239:23 running the receiver application would -- would		
	239:24 send a message -- would send a launch message to		
	239:25 the target of the transfer and that would cause it		
	240:01 to be launched. But the set -- the set playback		
	240:02 devices message itself doesn't -- wouldn't launch.		
	240:03 So what I'm saying is that set playback		
	240:04 devices can -- can indicate a transfer to a group.		
	240:05 And as a result of that, a launch message will be		
	240:06 sent to the leader of that group, which will -- but		
	240:07 it's not -- it's not caused -- it's not the set		
	240:08 playback message itself that launches the group.		
240:10 - 240:13	MacKay, Kenneth 2022-05-10	00:00:15	MacKay_K_vol1.81
	240:10 what device would be the recipient of the		
	240:11 set playback devices message in that scenario?		
	240:12 A. It would be the device where the receiver		
	240:13 app is currently running.		
240:21 - 240:25	MacKay, Kenneth 2022-05-10	00:00:20	MacKay_K_vol1.82
	240:21 Q. (By Mr. Shea) And then in that scenario,		

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DESIGNATION	SOURCE	DURATION	ID
	240:22 do I understand correctly that you're saying then		
	240:23 that the device that receives the set playback		
	240:24 device message would then be the one that sends the		
	240:25 launch message?		
241:02 - 241:06	MacKay, Kenneth 2022-05-10	00:00:25	MacKay_K_vol1.83
	241:02 THE DEPONENT: Yes.		
	241:03 Q. (By Mr. Shea) Now, to your knowledge,		
	241:04 would a set playback devices message be sent from		
	241:05 an app in a scenario where there is no active		
	241:06 stream established?		
241:09 - 241:11	MacKay, Kenneth 2022-05-10	00:00:08	MacKay_K_vol1.84
	241:09 THE DEPONENT: I think that it can be,		
	241:10 because it can be sent whenever the Cast session is		
	241:11 established.		
242:05 - 242:14	MacKay, Kenneth 2022-05-10	00:00:38	MacKay_K_vol1.85
	242:05 Q. (By Mr. Shea) And in that case, where --		
	242:06 if the target of the transfer request is now a		
	242:07 static group were -- the recipient is the -- of the		
	242:08 set playback device messages the leader, would that		
	242:09 device then, as part of that -- well, you called it		
	242:10 "reshuffling."		
	242:11 But as part of the additional		
	242:12 functionality that that device performs, will it		
	242:13 then send a launch notification to each follower of		
	242:14 the static speaker group?		
242:16 - 242:21	MacKay, Kenneth 2022-05-10	00:00:20	MacKay_K_vol1.86
	242:16 THE DEPONENT: Yes. So when the app is		
	242:17 moved to the virtual device representing the group,		
	242:18 the -- assuming this is on the leader -- that would		
	242:19 cause the leader to send out appropriate launch		
	242:20 messages to the followers that are connected to it		
	242:21 for that group.		
243:13 - 243:15	MacKay, Kenneth 2022-05-10	00:00:14	MacKay_K_vol1.87
	243:13 Q. (By Mr. Shea) And would it then		
	243:14 be configured to transmit the audio and the time		
	243:15 stamps to the follower once audio playback begins?		
243:17 - 243:17	MacKay, Kenneth 2022-05-10	00:00:01	MacKay_K_vol1.88
	243:17 THE DEPONENT: Yes.		

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DESIGNATION	SOURCE	DURATION	ID
255:25 - 256:10	MacKay, Kenneth 2022-05-10 255:25 Let me start by asking, is there a 256:01 specific team or group at Google that's tasked with 256:02 performing testing of physical products to -- to 256:03 evaluate functionality on those products? 256:04 A. I don't think -- I would say -- I 256:05 wouldn't say that there's a Google-wide team. But 256:06 the Nest organization or -- we do have a manual QA 256:07 team for at least some Nest devices. 256:08 Q. Would that manual -- is one of the things 256:09 that that manual QA team does is test the speaker 256:10 group functionality of those Nest devices?	00:00:50	MacKay_K_vol1.89
256:12 - 256:12	MacKay, Kenneth 2022-05-10 256:12 THE DEPONENT: Yes.	00:00:01	MacKay_K_vol1.90
260:21 - 260:23	MacKay, Kenneth 2022-05-10 260:21 Q. (By Mr. Shea) When did Google first 260:22 begin developing its speaker group technology, 260:23 Mr. MacKay?	00:00:06	MacKay_K_vol1.91
261:03 - 261:09	MacKay, Kenneth 2022-05-10 261:03 THE DEPONENT: I don't -- I don't know 261:04 when Google began developing it. When I started 261:05 working on it, I wasn't aware of any previous 261:06 efforts. 261:07 Q. (By Mr. Shea) And when was it that you 261:08 began working on it? 261:09 A. It would have been March of 2015.	00:00:26	MacKay_K_vol1.92
262:16 - 262:21	MacKay, Kenneth 2022-05-10 262:16 Q. (By Mr. Shea) Do you recall then why you 262:17 decided to implement it, in at least the initial 262:18 version of the speaker group technology, the groups 262:19 as static as opposed to dynamic groups? 262:20 A. As I recall, we were trying to be 262:21 compatible with the existing Cast ecosystem.	00:00:26	MacKay_K_vol1.93
262:22 - 262:24	MacKay, Kenneth 2022-05-10 262:22 Q. What was it about static groups that at 262:23 the time made them more compatible with the Cast 262:24 ecosystem than dynamic groups?	00:00:11	MacKay_K_vol1.12 4
263:01 - 263:09	MacKay, Kenneth 2022-05-10	00:00:41	MacKay_K_vol1.94

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DESIGNATION	SOURCE	DURATION	ID
	263:01 THE DEPONENT: It allowed the group to		MacKay_K_vol1.94
	263:02 advertise itself over mDNS, or I guess the leader		
	263:03 of the group to advertise the group over mDNS, as		
	263:04 a -- as a Cast device, and existing sender apps		
	263:05 would be able to use that as a Cast target.		
	263:06 Q. (By Mr. Shea) Are -- in your view, are		
	263:07 there advantages over that implementation relative		
	263:08 to a dynamic group implementation where the group		
	263:09 would not be advertised?		
263:12 - 263:13	MacKay, Kenneth 2022-05-10	00:00:04	MacKay_K_vol1.95
	263:12 THE DEPONENT: I would say there are		
	263:13 advantages and disadvantages.		
263:16 - 264:06	MacKay, Kenneth 2022-05-10	00:01:11	MacKay_K_vol1.96
	263:16 Can you tell me what you view to be the		
	263:17 advantages of -- of static over dynamics groups?		
	263:18 A. So one advantage might be that the group		
	263:19 is available as a Cast target separately from the		
	263:20 individual devices.		
	263:21 Q. And could you help me understand why you		
	263:22 view that to be an advantage.		
	263:23 A. It might make it easier for users to --		
	263:24 to target their content.		
	263:25 I don't know. I mean, you could see it		
	264:01 either way, I suppose, because dynamic groups you		
	264:02 explicitly select which devices are playing the		
	264:03 content.		
	264:04 Q. But you're saying that the -- with the		
	264:05 dynamic group, the drawback is that you have to		
	264:06 create it at the time?		
264:08 - 264:19	MacKay, Kenneth 2022-05-10	00:00:42	MacKay_K_vol1.97
	264:08 THE DEPONENT: Yeah. So the -- the		
	264:09 drawback of a static group would be that the user		
	264:10 has to create it ahead of time. So the user would		
	264:11 need to know what they want to do before they do		
	264:12 it, I guess.		
	264:13 But then the disadvantage of the dynamic		
	264:14 group is that the user has to take an action every		
	264:15 time as they're playing, I suppose, which might --		
	264:16 yeah, I -- I don't know. It's kind of a trade-off,		
	264:17 I suppose.		

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DESIGNATION	SOURCE	DURATION	ID
	264:18 Q. (By Mr. Shea) And when you say "take an 264:19 action every time" --		
264:23 - 264:25	MacKay, Kenneth 2022-05-10 264:23 THE DEPONENT: Okay. They have to 264:24 explicitly select the devices instead of targeting 264:25 to a named group.	00:00:17	MacKay_K_vol1.98
270:03 - 270:06	MacKay, Kenneth 2022-05-10 270:03 Q. As far as you're aware, was one of 270:04 Google's goals in developing and releasing its 270:05 multizone technology to compete with Sonos' 270:06 multiroom technology?	00:00:11	MacKay_K_vol1.11 7
270:08 - 270:12	MacKay, Kenneth 2022-05-10 270:08 THE DEPONENT: Not that I'm aware of. 270:09 Q. (By Mr. Shea) At the time you 270:10 were des- -- designing and developing Google's 270:11 multizone technology in 2015, were you aware of 270:12 Sonos' multiroom technology?	00:00:19	MacKay_K_vol1.11 8
270:14 - 270:17	MacKay, Kenneth 2022-05-10 270:14 THE DEPONENT: No. 270:15 Q. (By Mr. Shea) So in 2015, your -- your 270:16 testimony is that you were not aware of Sonos 270:17 having multiroom technology?	00:00:13	MacKay_K_vol1.11 9
270:22 - 270:22	MacKay, Kenneth 2022-05-10 270:22 THE DEPONENT: I said yes.	00:00:02	MacKay_K_vol1.12 0
270:25 - 271:01  T48.1	MacKay, Kenneth 2022-05-10 270:25 GOOG-SONOSNDCA-74185, and I think this is going to 271:01 get marked as 48.	00:00:17	MacKay_K_vol1.99
271:08 - 271:15  T48.1.1	MacKay, Kenneth 2022-05-10 271:08 Q. So if you look at the very top -- and -- 271:09 and we can work our way down to the beginning of 271:10 this chain -- but this is an email from -- well, it 271:11 says "eureka-dogfood-discuss@google.com" on behalf 271:12 of somebody named Matt Stuart. And the date at the 271:13 very top is -- is May 21st of 2015. 271:14 Do you see that? 271:15 A. Yes.	00:00:31	MacKay_K_vol1.12 1
271:16 - 271:20	MacKay, Kenneth 2022-05-10 271:16 Q. And do you see that there's a	00:00:12	MacKay_K_vol1.10 0

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DESIGNATION	SOURCE	DURATION	ID
 T48.1.5	<p>271:17 distribution list of people here, and then your</p> <p>271:18 name appears as, I think, the last name on the cc</p> <p>271:19 line.</p> <p>271:20 A. Yes.</p>		
271:21 - 271:22	<p>MacKay, Kenneth 2022-05-10</p> <p>271:21 Q. Do you recall this email chain?</p> <p>271:22 A. No.</p>	00:00:04	MacKay_K_vol1.12 2
271:23 - 271:24	<p>MacKay, Kenneth 2022-05-10</p> <p>271:23 Q. Do you have any doubts that you received</p> <p>271:24 this email chain in 2015?</p>	00:00:07	MacKay_K_vol1.10 1
272:01 - 272:02	<p>MacKay, Kenneth 2022-05-10</p> <p>272:01 THE DEPONENT: I have no reason to doubt</p> <p>272:02 that I received it.</p>	00:00:03	MacKay_K_vol1.10 2
272:03 - 272:08	<p>MacKay, Kenneth 2022-05-10</p> <p>272:03 Q. (By Mr. Shea) And before we dive in, can</p> <p>272:04 you just tell me what "dog food" means in this</p> <p>272:05 context?</p> <p>272:06 A. "Dog food" is a set of Google employees</p> <p>272:07 that get, I guess, prereleased versions of Google</p> <p>272:08 technology, in general.</p>	00:00:25	MacKay_K_vol1.12 3
274:11 - 275:04	<p>MacKay, Kenneth 2022-05-10</p> <p>274:11 Q. (By Mr. Shea) So then heading a</p>	00:00:53	MacKay_K_vol1.10 3
 T48.1.2	<p>274:12 little further up the chain, which -- which you've</p> <p>274:13 now been added to, do you see this email on</p> <p>274:14 Wednesday, May 20th, 2018, at 3:39, from</p> <p>274:15 Steve Chen?</p> <p>274:16 A. Yes.</p> <p>274:17 Q. It's about halfway --</p> <p>274:18 A. Uh-huh.</p> <p>274:19 Q. And he says "Are there any plans to</p> <p>274:20 enable grouping cast enabled speakers together</p> <p>274:21 similar to what Sonos does to allow multi-room</p> <p>274:22 playback?"</p> <p>274:23 Do you see that?</p> <p>274:24 A. Yes.</p>		
 T48.1.4	<p>274:25 Q. And then Mr. Shekel responds a short time</p> <p>275:01 later, "Yes." This "is planned and will be cross</p> <p>275:02 OEMs/Brands."</p> <p>275:03 Do you see that?</p>		

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DESIGNATION	SOURCE	DURATION	ID
	275:04 A. Yes.		

Sonos Affirmatives	00:32:12
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Google Counters	00:06:16
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TOTAL RUN TIME	00:38:28
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Documents linked to video:

T36

T38

T41

T48

T84